

WHAT IS CLAIMED IS:


- 1 1. A thin film magnetic head comprising:
2 a read unit, formed above a substrate, having a lower shield, a read element and
3 an upper shield; and
4 a write unit having a lower pole piece, an upper pole piece, and a coil placed
5 between said lower pole piece and said upper pole piece,
6 said read unit and said write unit being separated from each other with a non-
7 magnetic material;
8 wherein a magnetic material having a low coefficient of thermal expansion of
9 $11.5 \times 10^{-6}/K$ or less is used for forming at least part of the lower shield or the upper shield.
- 1 2. A thin film magnetic head according to claim 1, wherein said magnetic
2 material having low coefficient of thermal expansion is a crystalline magnetic alloy.
- 1 3. A thin film magnetic head according to claim 1, wherein said magnetic
2 material having low coefficient of thermal expansion is a NiFe alloy having a composition
3 comprising 30 to 55 wt% Ni.
- 1 4. A thin film magnetic head according to claim 1, wherein each of said lower
2 shield and said upper shield has a structure of a multilayer.
- 1 5. A thin film magnetic head according to claim 4, wherein said NiFe alloy layer
2 is used as a layer, except for layer closest to said read element.
- 1 6. A thin film magnetic head according to claim 1, wherein at least one of said
2 lower shield and said upper shield is a laminated film consisting of a layer formed from said
3 magnetic material having low coefficient of thermal expansion and a layer formed from a NiFe
4 alloy having a composition mainly comprising 80 wt% Ni, said 80 wt% NiFe alloy layer facing
5 to said read element.
- 1 7. A thin film magnetic head according to claim 6, wherein said magnetic
2 material having low coefficient of thermal expansion is a crystalline magnetic alloy.


1 8. A thin film magnetic head according to claim 6, wherein said magnetic
2 material having low coefficient of thermal expansion is a NiFe alloy having a composition
3 comprising 30 to 55 wt% Ni.

1 9. A thin film magnetic head according to claim 6, wherein a ratio of a thickness
2 of said magnetic material having low coefficient of thermal expansion to a sum of thicknesses of
3 said lower shield and said upper shield is 30% or more.

1 10. A thin film magnetic head according to claim 9, wherein said magnetic
2 material having low coefficient of thermal expansion is a crystalline magnetic alloy.

1 11. A thin film magnetic head according to claim 9, wherein said magnetic
2 material having low coefficient of thermal expansion is a NiFe alloy having a composition
3 comprising 30 to 55 wt% Ni.

1 12. A thin film magnetic head comprising: 
2 a read unit, formed above a substrate, having a lower shield, a read element, and
3 an upper shield; and
4 a write unit having a lower pole piece, an upper pole piece, and a coil placed
5 between said lower pole piece and said upper pole piece,
6 said read unit and said write unit being separated from each other with a non-
7 magnetic material;
8 wherein a side shield is provide on each side of said read element, part of said
9 side shield being formed from a magnetic material having a low coefficient of thermal expansion
10 of $11.5 \times 10^{-6}/K$ or less.

1 13. A disk storage device comprising: 
2 a recording medium;
3 a drive motor for driving said recording medium;
4 a magnetic head for reading and writing data from and on said recording medium;
5 a positioning mechanism for positioning said magnetic head;
6 a first circuit system for controlling said recording medium, said drive motor, said
7 magnetic head, and said positioning mechanism; and

8 a second circuit system for supplying a write signal to said magnetic head and
9 processing a read signal from said magnetic head;
10 wherein said magnetic head comprises:
11 a read unit, formed above a substrate, having a lower shield, a read
12 element and an upper shield; and
13 a write unit having a lower pole piece, an upper pole piece, and a coil
14 placed between said lower pole piece and said upper pole piece,
15 said read unit and said write unit being separated from each other with a
16 non-magnetic material;
17 a magnetic material having a low coefficient of thermal expansion of
18 $11.5 \times 10^{-6}/K$ or less used for forming at least part of the lower shield or the upper shield.

1 14. A disk storage device according to claim 13, wherein a flying height from an
2 air bearing surface to said recording medium is 20 nm or less.